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The on-screen version of the Collider-Accelerator Department Procedure is the Official Version.  
Hard copies of all signed, official, C-A Operating Procedures are kept on file in the C-A ESHQ Training Office, Bldg. 911A.*

## C-A OPERATIONS PROCEDURES MANUAL

### 2.2 Operating Practices

Text Pages 2 through 7

#### Hand Processed Changes

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Approved: \_\_\_\_\_  
Collider-Accelerator Department Chairman      Date

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## **2.2 Operating Practices**

### **1. Introduction**

The guidelines of this chapter describe watch standing practices that apply to all operating personnel. This chapter describes some important aspects of routine shift activities and watch standing practices.

Effective monitoring of accelerator equipment is necessary to detect abnormal conditions or adverse trends, so that appropriate action can be taken before equipment malfunction occurs. Notifying shift supervisors promptly of unusual or unexpected situations helps ensure that proper attention is given to changing and unusual conditions. Equipment status, and the authority to operate equipment, shall be understood by all operations personnel, so that activities can be controlled and coordinated. Operations personnel shall follow all the established rules for safety and quality assurance. A desire to conduct assigned tasks expediently should not interfere with safety and quality assurance rules.

It is the responsibility of the on-shift operating crew to safely operate the accelerator through adherence to written procedures and sound operating practices. The authority for accelerator operations is vested in the on-duty Operations Coordinator, and transferred only through formal turnover to a qualified Operations Coordinator. If a special test or abnormal condition arises, accelerator personnel shall be aware that the responsibility and authority to determine corresponding operating conditions, system alignments, or equipment manipulations, rests fully with the on-duty Operations Coordinator. The OC shall not permit any individual to bypass or overrule their operational judgement. If this happens, the OC shall bring the matter to the attention of higher line authority for operations.

### **2. Guidelines**

#### **2.1 Authority to Operate Equipment**

The Operations Coordinator is in charge of all activities relating to the operation of the accelerator. Any work by support groups during operations which might impact the operation of the accelerator, shall be approved by the Operations Coordinator.

#### **2.2 Operating Practice**

Operations personnel shall operate the components which make up each facility, with adherence to the engineering and technical specifications for each piece of equipment. Operators shall operate equipment within operating limits and operational safety requirements of each device.

## 2.3 Safety Practices

Operations personnel shall comply with BNL Requirements and C-A OPM policies and procedures. A controlled copy of C-A safety documents is kept in the Main Control Room (MCR). Operations personnel shall be trained periodically in emergency procedures.

## 2.4 Radiological Protection

All operating personnel shall abide by the radiation safety provisions of the BNL RAD Con Manual. A copy of this manual is maintained by the C-A Associate Chair for ESHQ and is available on the web. Day-to-day rules to be followed have been incorporated into the C-A OPM.

## 2.5 Radiological Exposure

Supervisors are required to examine exposure histories of their personnel, and restrict the duties of those having exposures above the C-A Administrative Levels.

The C-A Department goal is to keep individual and collective doses as low as reasonably achievable. In order to meet this goal the Administrative Levels are:

### 2.5.1 Administrative Control Levels

Administrative Control Levels are an integral part of the dose reduction scheme employed by the C-A Department. These levels are LESS than the dose levels set by DOE and Federal Regulations.

<b>C-A ADMINISTRATIVE CONTROL LEVELS FOR VISITORS AND MINORS</b>
Untrained visitor, untrained User, or untrained staff: Level of 25 mrem per year.
Minor (<18 years): 25 mrem per year plus written permission from a parent or guardian.

<b>C-A ADMINISTRATIVE CONTROL LEVELS FOR RADIATION WORKERS</b>		
Period of Interest	Maximum Administrative Control Levels, mrem	Administrative Control Level that may be authorized by Line Management.
Calendar Year	1000	1000 to 1250 (C-A Chair Approval)  1250 to 2000 (Lab Director Approval)
Day	100	100 to 200 (Approval authority will be on the RWP)
Lifetime	N rem Where N is Age of Person in Years	Laboratory Director Approval to Exceed N rem

- 2.5.1.1 The maximum daily dose to Radiation-Worker-I trained persons is 100 mrem. A first-line supervisor, or experiment spokesperson, may approve a dose between 100 and 200 mrem. The maximum calendar year dose is 1000 mrem. Various formal approvals must be obtained to go beyond these administrative levels.
- 2.5.1.2 After a female RWI-trained person voluntarily notifies the C-A management that she is pregnant, she is considered a declared-pregnant radiation-worker for the purpose of fetal and embryo radiation protection. The dose to the fetus during the gestation period is to be no greater than 350 mrem, at a rate of no greater than 35 mrem per month. Given that there is marginal sensitivity to detect low-level neutron dose, supervisors should not employ declared-pregnant radiation workers around beam lines during high-intensity proton operations. After a person voluntarily notifies the C-A management that she is pregnant, she must follow-up and notify management when she is no longer pregnant.
- 2.5.1.3 Untrained Users, staff, or visitors, are limited to no more than 25 mrem per year. Written permission must be obtained from the C-A Associate Chair for ESHQ to go beyond this. However, training in RW I is preferred if it is expected this level is to be exceeded. During the high intensity proton run the Department management does NOT allow untrained persons into experimental areas, since exceeding the 25 mrem level is possible in one day.

- 2.5.1.4 The annual dose limit to minors and students under age 18 years is 25 mrem. Exposures are administratively controlled. This is done by not allowing students and minors under the age of 18 years to work in Controlled or Radiological Areas without written permission. Written permission must be obtained from the C-A Associate Chair for Safety, and the individuals' parent or legal guardian.

## 2.6 Operator Inspection Tours

Inspection tours are conducted by: the AGS MMPS Operator, and the Cryogenic Technicians at RHIC and the Muon Storage ring.

Operator tours should be of sufficient detail to ensure the status of equipment is known. The following activities should be conducted:

- a) Components, such as alarm panels and autostart standby equipment, shall be inspected for abnormal or unusual conditions. Unexpected conditions, such as equipment vibrations, unusual noises or odors, or excessive temperatures, shall be reported to the OC so that pertinent personnel supervisors will be aware of the conditions, and be able to direct repairs, troubleshooting, or additional operator action as necessary.
- b) Equipment panel alarm light bulbs and annunciators shall be periodically checked to ensure satisfactory operation of visual and audible abnormal condition indicators.
- c) Each operator shall inspect all areas for which he/she is responsible, and note any deficiencies that may be present. These deficiencies may include steam, oil, or water leaks; fire and safety hazards or radiological problems; seismic concerns, such as open electrical panels and mobile objects; clogged floor drains, housekeeping or cleanliness problems; and building deficiencies, such as inoperative lighting, roof leaks, or doors that do not close properly.

Operators shall take appropriate action to correct or report deficiencies noted during tours. Equipment deficiencies shall also be documented in accordance with the "[Action Please](#)" log.

## 2.7 Response to Indications

Operators shall believe instrument readings and treat them as accurate unless proven otherwise.

Ignoring an unusual reading because the operator believes an instrument is faulty can cause abnormal conditions to be undetected. In general, operators shall check other indications, if possible, when unexpected readings are observed. Prompt action shall be taken to investigate the cause of abnormal or unexpected indications, so that prompt corrective action can occur. When malfunctioning or inaccurate instruments are discovered, they shall be appropriately identified to prevent subsequent confusion, and responsible personnel shall be notified to affect repairs. **Operators are instructed to follow Safety and Health requirements, achieve facility safety, personnel safety, pollution prevention requirements, and environmental protection requirements above facility production.**

#### 2.8 Resetting Protective Devices

When protective devices trip (e.g., Chipmunk alarms), an attempt shall be made to understand the cause of the trip before the device is reset. Normally, before action is taken, an operator shall ensure no abnormal condition exists that would preclude reset. However, because the consequences of inappropriately resetting protective devices vary considerably, good judgement and specific guidance are necessary in this area. The OC shall provide the appropriate guidance so that tripped protective devices will be properly addressed.

#### 2.9 Electrical Load Changes

Unless specified by written agreement, the Operations Coordinator shall approve all power or process rate changes, because the OC are held accountable for safe operation. Additionally, the OC will probably be the persons most knowledgeable of problems that occur as a result of load changes.

#### 2.10 Indicator Light Deficiency Identification

Indicator light deficiencies are noted by operations personnel in the Action Please Log.

#### 2.11 Filling out forms and checklists

Forms and checklists shall be filled out completely. Blank spaces are not permitted. If it is appropriate that no information be placed in individual spaces on a form, THEN write N/A (not applicable) in the space. If multiple copies of the same form are required to complete a process, THEN fill out all information on the top of the first sheet and "X" out the blank fields on the subsequent sheets. Multiple pages shall be stapled together before filing.

## 2.12 Remote Watchstander Safety

Watchstanders who are alone at remote stations, call the receiving stations listed below approximately every two hours to confirm their safety. These remote stations include, for example, g-2 Cryogenic Control Room, AGS MMPS, and at times, the CAS Watch, Tandem Watch, and the On-Duty RCT. The receiving station follows up if these calls are not received as expected. Communication may be made by radio, cell-phone, beeper, e-mail, or BNL phones. If routine communications are occurring between these stations during the shift, a separate communication for personal safety is unnecessary.

<u>C-A Complex Status</u>	<u>Message Receiving Station</u>
MCR Manned	MCR (x4662 or x7400)
MCR not Manned	BNL Police Group (x2238)

Arrangements should made with the Police Group with as much advance notice as possible. Any lone, remote watchstander can make these arrangements (including visual contact by Police during their routine tours) with the Police Group by calling x2238 at the start of their shift. The ESHQ Division Head is available to make arrangements for long term checks by the Police Group.